REMARKS

Claims 1-10, 12-27, and 29-32 will be pending upon entry of the present Amendment. Claims 1, 2, 10, 12, 20, 26, and 27 have been amended, and claims 11 and 28 are cancelled. New claims 31 and 32 are herewith submitted.

Applicant thanks the Examiner for indicating the allowability of the subject matter of claims 2, 3, 11, 12, 22, 23, and 28. Accordingly, claim 2 has been rewritten in independent form, including such limitations of claim 1 as applicant considers necessary to distinguish the claim over the art of record; claim 10 has been amended to include subject matter substantially similar to that of claim 11, which is cancelled; and claim 27 has been amended to include the subject matter of claim 28.

The Examiner has rejected claim 26 under 35 U.S.C. §112, second paragraph, as being indefinite, in particular for the use of the term "substantially," which is therefore deleted from claim 26.

The Examiner rejects claims 1, 4, 5, and 9 as under 35 U.S.C. §102(b) as being anticipated by Chung et al. (5,791,226, hereafter "Chung"). Claims 6, 7, 8, 10, 13-19, 20, 21, 24-27, 29, and 30 are rejected under 35 U.S.C. §103(a). In particular, claims 6 and 7 are rejected as being unpatentable over Chung in view of Smietana (5,197,516), claim 8 as being unpatentable over Chung in view of Crosser (5,138,838), claims 10 and 13-19 as being unpatentable over Chung in view of Johnson (4,204,459), claim 20 as being unpatentable over Chung in view of Johnson and Gray (5,887,674), and claims 21, 24-27, 29, and 30 as being unpatentable over Kakeya (4,716,729) in view of Chung.

In rejecting claim 1, the Examiner cites Chung's check valve 6 as being analogous to the means for admitting one-way passage of claim 1. Claim 1 has been amended to recite, in part, "means for admitting one-way passage of fluid from the second output port to the first input port, regardless of a position of the spool."

Referring to Figures 3 and 4, it may be seen that Chung's check valve 6 is positioned in the spool, and is part of the hydraulic circuit only while the spool is in the first position I (see column 4, lines 28-60). While the spool is in the second position II or in the central, neutral position, the check valve 6 is non-functional. Accordingly, Chung fails to

anticipate at least the cited limitation of claim 1, which is thus allowable thereover. Dependent claims 4-9 and 31 are also allowable as depending from an allowable base claim.

In amending claim 2 to place it in independent form, the means for admitting limitation was not incorporated from claim 1. Nevertheless, applicant believes that claim 2 is still allowable over the art of record together with dependent claim 3.

Claim 10 has been amended to recite, in part, "a check valve positioned and configured to prevent fluid flow into the hydraulic motor from the second input port at least while the high-pressure input port is coupled to the second input port." Neither Chung nor Johnson teach or suggest this limitation. Rather, each reference teaches against this limitation. For example, Chung states, referring to Figure 2 (see column 1, line 64-column 2, line 4),

> Meanwhile, when the valve CV is switched into the second position II, the pressurized fluid from the pump P passes through the internal line of the valve CV and the second line 101b, thus being applied to the small chamber of the arm cylinder ARM. In this case, the fluid in the large chamber of the arm cylinder ARM returns to the tank T through the first fluid line 101a and the internal line of the valve CV.

Johnson's operation is more complex, and so will not be analyzed here in detail, but one having ordinary skill in the art will recognize that, with respect to the application of high-pressure fluid to the hydraulic piston 10, Johnson's operation is similar to Chung's. Accordingly, claim 10, and dependent claims 12-20, are allowable over the cited art.

Claim 14 recites "[t]he system of claim 10 wherein the motor is configured to operate as a pump when the motor is caused to rotate in opposition to torque at the output shaft." This claim is allowable as depending from allowable base claim 10. However, the applicant believes that claim 14 is also allowable on its own merits. In rejecting claim 14, the Examiner states that "Johnson teaches a system having a hydraulic motor ... wherein the motor operates as a pump when the motor is caused to rotate in opposition to the applied torque," and further, that it would have been obvious to combine such a motor with Chung's system "for the purpose of driving an implement."

Applicant respectfully traverses this position. Johnson is entirely silent with respect to causing a motor to rotate in opposition to applied torque. The passage cited by the Examiner states, at column 2, lines 39-45,

> An exemplary embodiment of a hydraulic system made according to the invention is illustrated in the FIGURE and is seen to include a hydraulic motor 10 in the form of a double-acting hydraulic cylinder. However, it is to be understood that *the motor 10 may be a rotary output motor* and that the invention can also be used with efficacy in single-acting motors as well.

The italicized portion of the cited text is the full extent of Johnson's discussion of a rotary motor. Additionally, Johnson is directed to a problem that occurs when a load on the hydraulic system acts in concert with the application of fluid—i.e., applied torque (see column 1, lines 42-49). In other words, Johnson deals with a situation in which a load on the motor causes a tendency to move or rotate too fast *in the same direction* as the applied torque. Clearly, Johnson does not teach or suggest the limitation of claim 14.

Furthermore, even if Johnson did disclose such a device, there would be no motivation to combine with Chung. Applicant assumes that the "implement" mentioned by the Examiner as motivation to combine would be some device attached to the motor, so that it could be driven by the system. Applicant observes that when a motor is caused to rotate in opposition to applied torque, the motor is not driving a load (or an implement). Rather, the load is driving the motor. In the case of Chung, which is directed to operation of heavy equipment such as a power excavator, a situation in which the motor is caused to move in opposition to applied force would only occur if the load on the system exceeded the capacity of the system. Such an occurrence would force fluid from the cylinder ARM back up the high-pressure output fluid line 2 to the pump P, causing the pump P to counter rotate, and likely damage or destroy the engine driving the pump. Thus, there is no motivation to combine such a motor with Chung. Accordingly, claim 14 is allowable over the cited art.

With regard to the rejection of claim 16, the Examiner has indicated that the accumulator is an obvious design choice, and that Chung would perform equally as well with an accumulator. Applicant again traverses this position. As is known in the art, an accumulator is a storage device that stores highly pressurized fluid for delivery at a substantially constant pressure. Chung would not function properly with an accumulator as a high-pressure fluid source.

For example, Chung is directed primarily to construction vehicles. As is known in the art, such a system generally includes an internal combustion engine (ICE), such as a diesel engine, coupled to the pump P. When the hydraulic system is loaded, i.e., when the valve is

moved to the second position II to raise an excavator bucket, for example, fluid flow into the cylinder is resisted by the weight of the bucket, which in turn slows the rotation of the pump P and the ICE. A governor responds by applying power to the ICE to bring the rpm's back to a selected level, or to a higher level. However, when the valve is moved to the neutral position, the opposite occurs. When the load is removed, the governor reduces power to the engine back to an idle condition. Referring to Figure 4, it may be seen that, with the control valve CV in the neutral position, the valve provides an open path for fluid to flow from the pump P to the tank T. This allows the pump to move fluid while at idle so that no load is detected by the engine. If this open path were closed, it would hydraulically lock the pump, causing the ICE to suddenly stop rotation. At the very least, this would require restarting of the ICE, and might cause serious damage. Thus, the open path is essential for proper operation of Chung's system. If an accumulator were added to the circuit, every time the valve was placed in neutral, all of the stored fluid would escape through the open path, wasting the energy expended in pressurizing the fluid. Additionally, the accumulator would constitute a separate path for fluid during load conditions, which would affect functionality of the system. Claim 16 is therefore allowable on its own merits, apart from its allowability as depending from claim 10.

Claim 21 recites, in part, "a check valve configured to permit one-way fluid passage from the input port to the first valve port." In rejecting claim 21, the Examiner states that it would have been obvious to combine Chung's check valve with Kakeya's system. Applicant respectfully disagrees. Chung (like Johnson) is directed to a situation in which a load on the arm cylinder causes a tendency to move or rotate too fast in the same direction as the applied torque (see column 2, lines 25-47). Johnson refers to such a condition as a negative load (see Johnson, column 1, line 43). For example, one might imagine a loader bucket that is raised by hydraulic power to dump a load of gravel into a truck. When the operator moves the valve to lower the bucket, the weight of the bucket, alone, serves to drive fluid from the arm cylinder via fluid line 1b. However, without the check valve (6) there is no corresponding increase in fluid flow through fluid line 1a, since the engine does not experience any load, and so the governor does not increase the rate at which the pump operates. The result is a drop in pressure in the fluid line 1a until a vacuum forms in the line and results in cavitation. The check valve (6)

provides a passage whereby some of the fluid in fluid line 1b is shunted to fluid line 1a to supplement the lower fluid flow in that line, and to hold some pressure in that line. It should be noted that the condition that motivates the need for the check valve is the negative load described above.

Kakeya is directed to a specialized system for hydraulically driving a counterweight dolly of a crane. Figure 6 shows such a crane and dolly. The disclosed hydraulic system powers the wheels of the dolly to follow the crane as it swivels, in order to maintain a position behind the crane. It is known in the art that such a crane requires a substantially level surface for proper operation. Accordingly, movement of the dolly always requires a positive force. Kakeya does not contemplate a condition under which its system would encounter a negative load, and so has no need for a check valve as taught in Chung. . .

Additionally, it may be seen with reference to Figures 1 and 2, that the valves 28, 31, and 40, which control the supply of pressurized hydraulic fluid from source 29, actually shut off the flow of fluid while in the neutral position, and do not provide an open path as taught by Chung. This suggests that the fluid is not supplied by a governor-controlled pump, but is instead provided by a constant-pressure supply. This means that, even under a negative load condition, there would be no danger of cavitation, since the hydraulic fluid would remain at the same high pressure, regardless of the load condition. A check valve such as that taught by Chung would unnecessarily add to the cost and complexity of Kakeya's system, with no benefit derived. Clearly, there is no motive to combine these references, and thus there is no *prima facia* case of obviousness. Accordingly, claim 21 is allowable over the cited art. Dependent claims 22-26 are therefore also allowable therewith.

While new claim 32 differs in scope from claim 1, the argument submitted in support of the allowability of claim 1 may also be applied in support of the allowability of claim 32. In particular, claim 32 recites, *inter alia*, "a check valve configured to permit fluid passage from the second input port to the high-pressure input port, *regardless of a position of the spool.*" As demonstrated, the prior art of record fails to teach or suggest this limitation, which is therefore allowable.

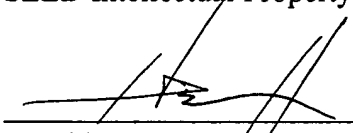
The remaining rejections are directed to dependent claims, and are moot in view of the allowability of the respective base claims. Accordingly, these rejections will not be discussed at this time.

All of the claims remaining in the application are now allowable. In the event the Examiner finds minor informalities that can be resolved by telephone conference, the Examiner is urged to contact applicant's undersigned representative at (206) 694-4848 in order to expeditiously resolve prosecution of this application.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

SEED Intellectual Property Law Group PLLC



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